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AMICON LINK LEVEL PROTOCOL NOTES

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The protocol which forms the basis for the AMICON Link Level design is a subset of ADCCP-HDLC Level 2 protocol. In this protocol the standard unit of information is the frame:

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| SYNC | SYNC | FLAG | DC | SC | RC | CNTL | PID | TEXT | FCS1 | FCS2 | FLAG |
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where

SYNC	-	preframe synchronization, idle flags or zeroes
FLAG	-	start of frame, bit pattern 01111110
DC	-	destination callsign address field (6 chars + SSID)
SC	-	source callsign address field (6 chars + SSID)
RC	-	repeater callsign address field (optional)
CNTL	-	control byte, indicates type of frame, other info
PID	-	protocol ID byte for frames with text
TEXT	-	optional information field
FCS1	-	first byte of frame check sequence (CRC)
FCS2	-	second byte of frame check sequence
FLAG	-	closing flag

Callsign address fields are constructed in the following manner:

CHAR1 CHAR2 CHAR3 CHAR4 CHAR5 CHAR6 SSID

where each call is left justified in the field, padded with blanks, uppercase if possible, and each CHAR is shifted left so that the LSB is zero, except for the last byte of the address fields, where the LSB is set to one, indicating the end of HDLC extended addressing. The SSID byte is of the form

R 11 SSSS X

where R is the "repeated" bit, set to one only in the optional repeater addressing field when the packet has been repeated. The 11 field is reserved and set to ones. It may be used for control purposes if required by a local area net. The SSSS field is the sub-station code, normally all zeros except for situations where a person has more than one station on the air. The X is normally zero, unless this field is the last of the callsigns, in which case it is set to one, indicating the end of the variable length address field.

Other features used:

bit stuffing	-	provides fully transparent transmission of data
NRZI encode	-	Zeroes cause transition which allows clock recovery
multiframe	-	Up to seven frames permitted in a single transmission

Types of frames:

Unnumbered	-	Used for Link Control & Broadcast
Supervisory	-	Used for window & flow control
Information	-	Used for transmission of text

Unnumbered Frames:

FLAG DC SC RC CNTL PID TEXT FCS1 FCS2 FLAG

DC	-	Destination Call, target station for this packet
SC	-	Source Call, originating station for this packet
RC	-	Repeater Call, specifies repeater to be used (if any)

CNTL - 2FH = Initiates a Connect Request (SABM)
 43H = Initiates a Disconnect Request (DISC)
 63H = Acknowledges a Connect or Disconnect (UA)
 0FH = Disconnected Mode Status Response (DM)
 87H = Frame Reject Status Response (FRMR)
 03H = Broadcast Information Packet (UI)

The Poll/Final (P/F) bit, 10H, is used to force a response from the receiving station. Used here and in other frame types for this function.

PID - Protocol ID for frames containing text (see I-Frames)
 TEXT - Text field information, only for broadcast packets

Supervisory Frames:

FLAG DC SC RC CNTL FCS1 FCS2 FLAG

DC etc. - Address fields, as above

CNTL	7	6	5	4	3	2	1	0	
	Nr		P/F		0	0	0	1	Receive Ready
	Nr		P/F		0	1	0	1	Rcv Not Ready
	Nr		P/F		1	0	0	1	Reject

Nr = Sequence count of next expected I-frame
 P/F = Poll/Final bit

Information Frames:

FLAG DC SC RC CNTL PID TEXT ... TEXT FCS1 FCS2 FLAG

DC etc. - Address fields, as above

CNTL	7	6	5	4	3	2	1	0	
	Nr		P/F		Ns		0		I-frame

Nr = Sequence count of next expected I-frame
 P/F = Poll/Final bit
 Ns = Sequence count of this I-frame

PID - Protocol ID, defines contents of TEXT field

xx00yyyy = Reserved, undefined at present
 xx0lnnnn = Reserved for AX.25 protocol
 xx10nnnn = Reserved for AX.25 protocol
 11110000 = plain text, no Level 3 protocol
 xx1lyyyy = Reserved, undefined at present

TEXT - Text field, 256 bytes maximum, ASCII code

The source reference for questions about this protocol is in the ANSI Standard Document X3.66 describing ADCCP. We use the Balanced Mode of operation, with sub-options 2, 4, 7, 8, and 11.

